

### PROVE SULPHUR FINE FERTILIZER FOR ALFALFA IN VALLEY

Cost of fertilizing alfalfa reduced probably 70 per cent. During the last three years this experiment station has been conducting extensive fertilizer experiments on fruit trees and alfalfa in this valley. These experiments have been conducted in various orchards and on various farms in all sections of the valley. During this time very valuable and interesting results have been obtained from the use of commercial fertilizers on alfalfa. It has been found that on some types of soil the yield of alfalfa can be increased from 25 to 500 per cent by the use of either superphosphate or gypsum. It has also been found that no increase in yield of alfalfa has been obtained on these soils by the use of potash, nitrogen or lime when used as fertilizers.

Since superphosphate and gypsum gave such marked increases in the yield of alfalfa the writer decided to determine why this was true. It is well known that superphosphate is a compound of phosphorus, sulphur, calcium, oxygen and hydrogen. Oxygen and hydrogen are absolutely worthless in any fertilizer; and for this valley calcium also is worthless in fertilizers, as our soils are naturally so well supplied with lime. Phosphorus is a valuable plant food, and many soils throughout the world are deficient in this element. The beneficial results from the use of superphosphate have always been attributed by chemists to the element phosphorus. Sulphur has generally been regarded as a worthless element in commercial fertilizers.

Gypsum or land plaster contains only calcium, sulphur and oxygen. It has already been stated that calcium in fertilizers is worthless for our soils, and oxygen is of no value in any fertilizer.

We have noted that superphosphate and gypsum produce similar results in increasing the yield of alfalfa; but gypsum contains absolutely no phosphorus, potash or nitrogen—the three chief plant foods contained in commercial fertilizers. Chemists have therefore concluded that gypsum is only of indirect value—serving a chemical function in making available in the soil supplies of potash and phosphorus already present.

Since the marked increases in the yield of alfalfa here were attributed to the element phosphorus in the superphosphate, the writer determined to purchase phosphorus in the cheapest form. Hence ground phosphate rock, which contains 33 per cent phosphorus, was purchased and used in our fertilizer experiments by itself, and also in combination with stable manure. These alfalfa plots thus treated have shown absolutely no increase in yield over the check plots receiving nothing.

These results indicated that the marked increases obtained from the use of superphosphate were possibly not due to the element phosphorus in the superphosphate. Since superphosphate and gypsum had given similar increases in yield, and both contain the element sulphur the writer concluded that probably these increases in the yield of alfalfa were due to the element sulphur. Experiments were started to determine this point. A portion of a field was selected where the alfalfa had been giving unsatisfactory yields for years. This field was carefully platted. Two plots were fertilized with ground sulphur; one plot with iron sulphate; one plot with superphosphate; and two plots with ground phosphate rock. Check plots receiving no fertilizer were left alongside the fertilized plots for comparison. The plots receiving the ground phosphate rock gave no increase in yield over the unfertilized plots. The unfertilized plots yielded practically the same amounts as in previous years.

The plots receiving ground sulphur, iron sulphate and superphosphate, at the rate of 300 pounds per acre, produced an increase of more than 100 per cent over the unfertilized plots. Each of these three plots yielded practically the same amount. It will be noted from this that each of these three plots received in the material applied the element sulphur.

The ground sulphur contains practically nothing but sulphur, the sulphate contains only sulphur, iron and oxygen, while the superphosphate contains sulphur, phosphorus and lime.

These results show that the element sulphur when applied by itself gave equally as good results as the other elements. It is probable iron gave as good results as superphosphate.

It is clear from this that the element sulphur is of great importance as a fertilizer for alfalfa on some soils in this valley. It is probable

that the marked increases in yield of alfalfa where gypsum has been used is due to the sulphur that it contains. It is possible that this is also true of the superphosphate.

These results indicate that the element sulphur may be of far more importance as a fertilizer on some soils than has been supposed heretofore. For example, sulphur, so far as the writer knows, has never before been recommended as a fertilizer. Because most plants use so little sulphur and as most soils contain a limited amount of this element, it has never received serious consideration as a fertilizer.

The writer must state that he does not know whether the chief value of sulphur as a fertilizer for alfalfa is due to its value as a plant food or whether it is of value indirectly in making available stores of plant food already in the soil. If the latter is true then it should not be considered as a fertilizer but as a soil stimulant.

These experiments are being repeated in various sections of the valley to determine whether sulphur will give similar results when applied as a fertilizer to our various types of soil. Experiments are also being conducted to determine the most profitable amount of sulphur to apply per acre.

Our experiments have shown that the total yield of alfalfa in this valley could easily be doubled by the use of superphosphate as a fertilizer. The most marked increases in yield have been obtained from the use of superphosphate on the poorer soils. Some of the very fertile soils have not given any increased yields from its use. On such fertile soils application of sulphur will probably prove of little value.

The most economical form in which to purchase sulphur at the present time is ground sulphur. When purchased in this form it costs less than two cents per pound.

If gypsum is of value in supplying any sulphur, as these experiments strongly indicate, then its use as a fertilizer at present prices is not justifiable.

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#### IOWA BANKERS ARRESTED UPON CHARGES OF FORGERY

ELDORA, Ia., May 15.—Henry D. Himmel, president, and John E. Himmel, cashier of the Farmers' bank at Radcliffe, were arrested today, charged with forgery. The Farmers' bank, a private institution, closed its doors yesterday.

### INTERNATIONAL COUNTERFEITERS' PLANT SEIZED

SEATTLE, Wash., May 15.—The discovery of a gang of international counterfeiters became known when it was made public today that two days ago United States secret service operatives seized a counterfeiting plant in Seattle valued at \$2000 and that detectives were working on clues concerning the identity of the counterfeiters who have been operating in Western Washington and British Columbia and eastward through Canada as far as Ottawa. The plant was discovered in a store-room near the waterfront, and indicated that Seattle has been the headquarters of the gang, whose operations have been under investigation four months. The plant is said to be the most complete the government has seized since the Leon Gang was broken up in British Columbia five years ago. The counterfeiters have been turn-

ing out twenty dollar Canadian bank notes and Canadian five dollar bills, and secret service men estimate that at least \$10,000 of this money has been passed on the Pacific coast in the last six months.

### HEAE STUFFED UP?

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# MANN'S

CENTRAL AVENUE, NEAR POSTOFFICE  
SALE STARTS SATURDAY, MAY 16

<b>VESTS</b> Womens Summer Vests, all sizes, special for this sale, each..... <b>5c</b>	<b>THREAD</b> Clark's O. N. T. Spool Cotton, <b>7 for 25c</b>	<b>15c LACES 5c</b> 5000 yards Val. and All Linen Torchon Laces, up to 15c values, this sale, yard..... <b>5c</b>	<b>15c EMB. 5c</b> 5000 yds. wide Cambrie Emb., up to 15c values, this sale, yard..... <b>5c</b>
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## This May Sale of White Goods is a Great Money-Saving Event

SHADOW FLOUNCING AT HALF PRICE			EMBROIDERIES AT LESS THAN HALF			CHILDREN'S MUSLIN UNDERWEAR		
24-inch Shadow Flouncings, new patterns, real \$1 values, this sale, yard,	18-inch Shadow Flouncings, new patterns, real 75c values, this sale, yd.,	12-inch Shadow Flouncings, new patterns, real 50c values, this sale, yd.,	5000 yds new Cambrie and Swiss edgings up to 25c values, sale price, yd.,	2000 yds. Corset Covers, Embroideries and Flouncings up to 50c values, yd.,	2000 yds. wide Swiss Flouncings up to 75c values, yd.,	Lot 1 Childrens Muslin Drawers, Waists and Skirts up to 15c values, sale price each,	Lot 2 Childrens Muslin Skirts, Waists and Drawers up to 25c values, each,	Lot 3 Childrens Muslin Skirts, Waists and Drawers up to 35c values, each,
<b>48c</b>	<b>39c</b>	<b>29c</b>	<b>10c</b>	<b>25c</b>	<b>39c</b>	<b>7½c</b>	<b>12½c</b>	<b>17½c</b>

### FREE---Save Your Saleslips and get Wm. Rogers' Triple-Plated Guaranteed Silverware FREE

WHITE GLOVES			WHITE HOSIERY			LONG CLOTH			INDIA LAWN		
Kaysers White Chamiosette Washable Gloves, pr.	Kaysers White 16 button Lisle Gloves pr.	Kaysers White 16 button Silk Gloves	Childrens Fine Lisle Hose, all sizes, pr.,	Women's Silk Lisle Hose, all sizes, fine quality, pr.,	Women's White Silk Hose, all sizes, pr.,	Bolt of 12 yds., worth \$1.35, special, bolt,	Bolt of 12 yds., worth \$1.60, special, bolt,	Bolt of 12 yds., worth \$1.75, special, bolt,	32-inch very fine 15c grade, special, yd.,	52-inch very fine 18c grade, vd.,	32-inch very fine 20c grade, yd.,
<b>25c</b>	<b>48c</b>	<b>98c</b>	<b>25c</b>	<b>25c</b>	<b>59c</b>	<b>\$1.10</b>	<b>\$1.35</b>	<b>\$1.59</b>	<b>10c</b>	<b>12½c</b>	<b>15c</b>

MAY SALE OF SHEETS, TOWELS AND LINENS				MAY SALE OF MUSLIN UNDERWEAR			
72x90 Sheets, real 60c values, each,	42 and 45-inch Pillow Slips, each,	72x90 Pequot Sheets, 95c grade special, each	Fruit of the Loom Muslin, 15c grade, special, yd.,	Women's Gowns nicely trimmed, 75c values, sale price, each,	Women's Drawers, all sizes, 50c values, each,	Combination Suits, good \$1.25 values, sale price, each,	Crepe Night Gowns, \$1.00 values, sale price, each,
<b>39c</b>	<b>12½c</b>	<b>83c</b>	<b>11c</b>	<b>59c</b>	<b>29c</b>	<b>98c</b>	<b>69c</b>
Bed Spreads full size, \$1.25 values, special, each,	25 doz. heavy Huck Towels, 15c values, each,	25 doz. Bleached Bath Towels, special, each,	25 doz. Heavy Bath Towels, 18c values, special, each,	Combination Suits, Knickerbocker styles, suit,	White Skirts \$1.00 values, special, each,	Corset Covers nicely trimmed, special, each,	New Brassieres, 75c values, special, each,
<b>98c</b>	<b>10c</b>	<b>8c</b>	<b>12½c</b>	<b>\$1.25</b>	<b>79c</b>	<b>48c</b>	<b>59c</b>
50c Bath Towels, extra size, special, each,	75c Bath Towels, evry special, Sat. each,	50c Table Damask, new patterns special, yd.,	42 and 45-inch Pillow Slips, Pequot brand, special, each,	Princess Slips, good quality, special, each,	Beautiful New Night Gowns, \$1.25 values, each	Misses Drawers and Skirts, special, each,	New Style Combination Suits, special, a suit,
<b>39c</b>	<b>50c</b>	<b>39c</b>	<b>22c</b>	<b>98c</b>	<b>98c</b>	<b>29c</b>	<b>\$1.69</b>

## ONE-THIRD OFF ALL SPRING COATS AND SUITS---ONE-THIRD OFF